



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,933	04/05/2004	Anna H. Dyson	047182-0128	3078
22428	7590	03/22/2006		
FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			EXAMINER HARRINGTON, ALICIA M	
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/816,933

Applicant(s)

DYSON ET AL.

Examiner

Alicia M. Harrington

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-20 and 49-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-8, 49, 58 and 59 is/are allowed.
- 6) ☒ Claim(s) 9-20 and 50-56 is/are rejected.
- 7) ☒ Claim(s) 57 and 60 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/30/05 have been fully considered but they are not persuasive. Applicant argues the back support structure of Charlton (US 4,326,012) has the same cross sectional area at the top and bottom (see pages 10-11 of applicant's remarks). However, the Examiner must respectfully disagree. Applicant says area defined as element number 13 is the back support structure, and as illustrated in figure 5, this area has different cross sectional areas at the top and bottom. The conical area (side walls 16 spread larger at the top than at the bottom) as describe by the Examiner as the support structure meeting the claimed limitations of a larger first cross section area than a second cross sectional area is all apart of the structure. Thus, the conical area meets the claimed limitation. The rejection of Barone (US 6,700,055) in view of Charlton (US 4,326,012) will be repeated.

2. Applicant's arguments with respect to claim 3 on page 8 was found persuasive, the rejection of claims 3-8, and 49 has been withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9-12,14,15 and 49,50-53,55,56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barone (US 6,700,055) in view of Charlton (US 4,326,012).

Regarding claims 9,10,50,53,55 and 56, Barone discloses a solar module, comprising: a Fresnel lens (1) comprising a substantially polygonal focusing portion adapted to focus solar radiation to a polygonal area; and a back support structure (H) adapted to support a solar cell (3) at a predetermined distance from the Fresnel lens such that solar radiation is focused onto the solar cell;

wherein: the back support structure has first portion (top region) connected to the Fresnel lens and a second portion adapted to support the solar cell (3; see figures 1 and 3 and col. 2); and the first portion (top) of the back support structure has a first cross sectional area and a second portion (bottom) of the back support structure has a second cross sectional area. However, Barone fails to specifically disclose the solar cell is photovoltaic cell, claimed dimensions of the Fresnel lens and support structure, located within a building façade, and the first cross section area is larger than the second cross section area.

In the same field of endeavor, Charlton teaches an integrated support structure wherein the first means comprises a back support structure which has a first cross sectional area (spreads larger at the top near lens-side walls 16) at a first portion adapted to be connected to the Fresnel lens (19) and a second cross sectional area smaller than the first cross sectional area at a second portion adapted to support the photovoltaic cell (12; see figure 5) located within a building façade envelope (external

building walls). The cross sectional areas are specifically the conical area (side walls spread larger at the top than at the bottom), as the support structure meeting the claimed limitations of a larger first cross section area than a second cross sectional area is all apart of the structure. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Charlton, since it is a well known support structure and provides an efficient, durable solar concentrator.

Lastly, Barone and Charlton fail to disclose the claimed support dimensions. However, the operation of the device is not otherwise changed and such modification would have involved a mere change in size of the component. The change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

Regarding claim 11-12, Barone and Charlton discloses claim 10. However, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material. Charlton teaches a reflective material for directing light into the solar cell where the reflective material is conically shaped to block the focused radiation from being visible from the back side of the back support (not visible via material 13-see figure 5 for example). However, Charlton fails to specifically disclose the material is diffusively reflective. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the surface

diffusively reflective, since it known in the prior art and would produce an increase the amount scattered in the conical structure and detected by the photovoltaic cell.

Regarding claim 14, Barone and Charlton further teaches the module of claim 10, where in Barone disclose the solar cell comprises a polygonal cell (3) which is mounted at a distance from the Fresnel lens (1) so that a size of an area of solar radiation focused by the Fresnel lens substantially matches a size of the photovoltaic cell radiation receiving area (see figure 3 of Barone).

Regarding claim 15, Barone and Charlton disclose the claimed invention of claim 10. Barone disclose a large single top Fresnel lens layer (covering opening and secondary Fresnel lens array). Charlton also discloses single Fresnel lens element-see figure 5. However they fail to specifically disclose the module of claim 10, wherein the second area of the support structure comprises an area of 0.5 to 1.5 cm square or less, and a length of the support structure from the first area to the second area is 10 to 10 cm or less and the photovoltaic cell radiation receiving are is 1.5 cm square or less. However, the operation of the device is not otherwise changed and such modification would have involved a mere change in size of the component. The change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237(CCPA 1955).

Regarding claims 51-52, Barone and Charlton fail to specifically disclose the percent of solar energy captured and transformed into electricity. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include this feature in solar concentrator, since it is known in the art to convert heat using a

solar cell that converts at least 30 percent of the solar energy (official notice taken to this fact) and the higher the conversion rate the lower the cost of energy use in the building system.

5. Claims 13,16-20,54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barone (US 6,700,055) in view of Charlton (US 4,326,012), further in view of Kaminar et al (US 6,020,554).

Regarding claims 13 and 54, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material.

Charlton further discloses a substantially conical structure comprising a reflective material. However, Charlton fails to specifically disclose the material is diffusively reflective. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the surface diffusively reflective, since it known in the prior art and would produce an increase the amount scattered in the conical structure and detected by the photovoltaic cell. Thus, it would have been further obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Charlton, to provide an collector that is efficient and durable in building structures.

Barone further teaches the support can be a scaffling structure. A scaffling structure would be an equivalent to wires or rods support structure. Furthermore, as taught by Kaminar, a snap fit structure, helps when assembling the housing. Thus, it

would have still been obvious to one of ordinary skill in the art at the time the invention was made to provide a snap fit configuration, since the collector support would be easily assembled.

Regarding claim 16, Barone and Charlton disclose the module of claim 10. Barone further comprises: a focusing lens array (2; see col. 4, lines 20-42; functional equivalent of single lens covering the area) located between the Fresnel lens (1) and the solar cell (3); However Barone fails to specifically disclose the solar cell is a photovoltaic cell and a heat sink connected to the second portion of the back support structure, such that the photovoltaic cell is mounted in contact with the heat sink.

Kaminar discloses a Fresnel lens (11) and photovoltaic cell with a heat sink (15) connected to the second portion of the back support (see col. 3, lines 45-65), such that the photovoltaic cell is mounted in contact with the heat sink. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone and Charlton, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and a collector that is easily assembled without specialized tools.

Regarding claim 17, Barone, Charlton and Kaminar disclose the module of claim 16, Kaminar further discloses wherein: the heat sink is selected from a group consisting of radioactive type heat sinks (see col. 3), cooling fluid type heat sinks, passive cooling type heat sinks and heat-pipe type heat sinks. However, Barone, Charlton and Kaminar fail to specifically disclose the photovoltaic cell (a semiconductor is selected from a group consisting of III-V semiconductor solar cells and vertical multi-junction (VMJ) solar

cells. Although, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cell that multi-junction or semiconductor group II-V, since they are well known solar cells in the art (the Examiner takes official notice to this fact) and multi-junction cells, for example, can be highly efficient in converting sunlight into direct electricity.

Regarding claims 18-19, Barone, Charlton and Kaminar disclose the module of claim 16, wherein Kaminar further discloses the Fresnel lens is interlocked or snap fitted to the first portion (top) of the back support structure; and the heat sink (see col. 3) is interlocked or snap fitted to the second portion (bottom portion of 18; 15,16) of the back support structure where photovoltaic cell (28) is attached to the heat sink (15). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone and Charlton, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and a collector that is easily assembled without specialized tools.

Regarding claim 20, Barone and Charlton disclose the module of claim 10, Barone and Charlton fail to specifically disclose further comprising at least one air gap between the Fresnel lens and the back support structure.

Kaminar illustrates in figure 5 how the lens and back support structure fit together. As illustrated there exist an air gap in the cavity 56, such that in the connection air gaps exist between the lens and hairpin terminal 53. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Barone and Charlton, as taught by Kaminar, to provide a collector that receives a good

concentration of solar energy and an collector that is easily assembled without specialized tools.

Allowable Subject Matter

6. Claims 3-8,49,58,59 are allowed.
7. Claims 57,60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is an examiner's statement of reasons for allowance: Regarding claim 3, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed limitations which include a kit for forming a solar module comprising a Fresnel lens; and a first means for supporting a photovoltaic cell inside a window in a building as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

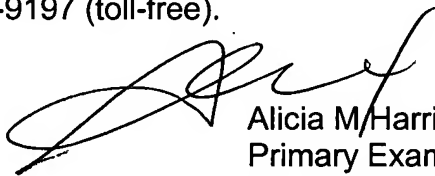
9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Harrington whose telephone number is 571 272 2330. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571 272 2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Alicia M. Harrington', is positioned above the printed name and title.

Alicia M. Harrington
Primary Examiner
Art Unit 2873

AMH